3.0 DESIGN ALTERNATIVES

3.1 FUTURE SERVICE AREA.

There are three general alternatives for the design service area of the Upper Southeast Salt Creek trunk sewer. As discussed in Table 3, the options include the Comprehensive Plan - Tier I service area, the Comprehensive Plan - Tier II service area, and the Total Ridgeline service area. Due to the long-term planning horizon for major trunk sewers, the Tier I option is not recommended. The choice between the Tier II and Total Ridgeline service areas will depend upon the City's determination of growth potential for the southern end of the S-5 Urban Planning Zone, and whether it is appropriate to include the area that is currently within the planning jurisdiction of the Village of Roca, but not within the Tier II or Tier III planning area for the City of Lincoln.

Potential grade limitations at the crossing of the S-2/S-3 basin drainage channel will affect the vertical alignment and pipe size for this project. Depending upon the service area and corresponding design flow, the trunk sewer may need to change in size and slope to accommodate the chosen alternative. The Tier II option appears to be serviceable with a 48-inch diameter pipe, but the Total Ridgeline option may require a 54-inch diameter pipe because of the grade limitations. In addition the existing 48-inch trunk sewer does not have the necessary capacity to serve all of the Total Ridgeline area, though the difference between pipe capacity and the theoretical design flow is less than 5% (49.8 cfs versus 51.8 cfs).

3.2 ALTERNATIVE ALIGNMENTS AT ROKEBY ROAD.

There are also three alternatives for the alignment and crossing of the BNSF railroad at Rokeby Road. The first option is to begin the crossing north of Rokeby Road, and bore under the tracks on an approximate perpendicular alignment, then cross into the Wilderness Ridge golf course detention cell. This alignment will avoid any disruption of the woodland area and the oxbow of Salt Creek in Wilderness Park, but from preliminary geotechnical investigations, will likely encounter sandstone in the bore and on the golf course property. In addition the ground elevation in the golf course area is significantly higher (approximately 10 feet) than the area to the south. The sandstone and additional depth on this alignment will increase the cost of the project.

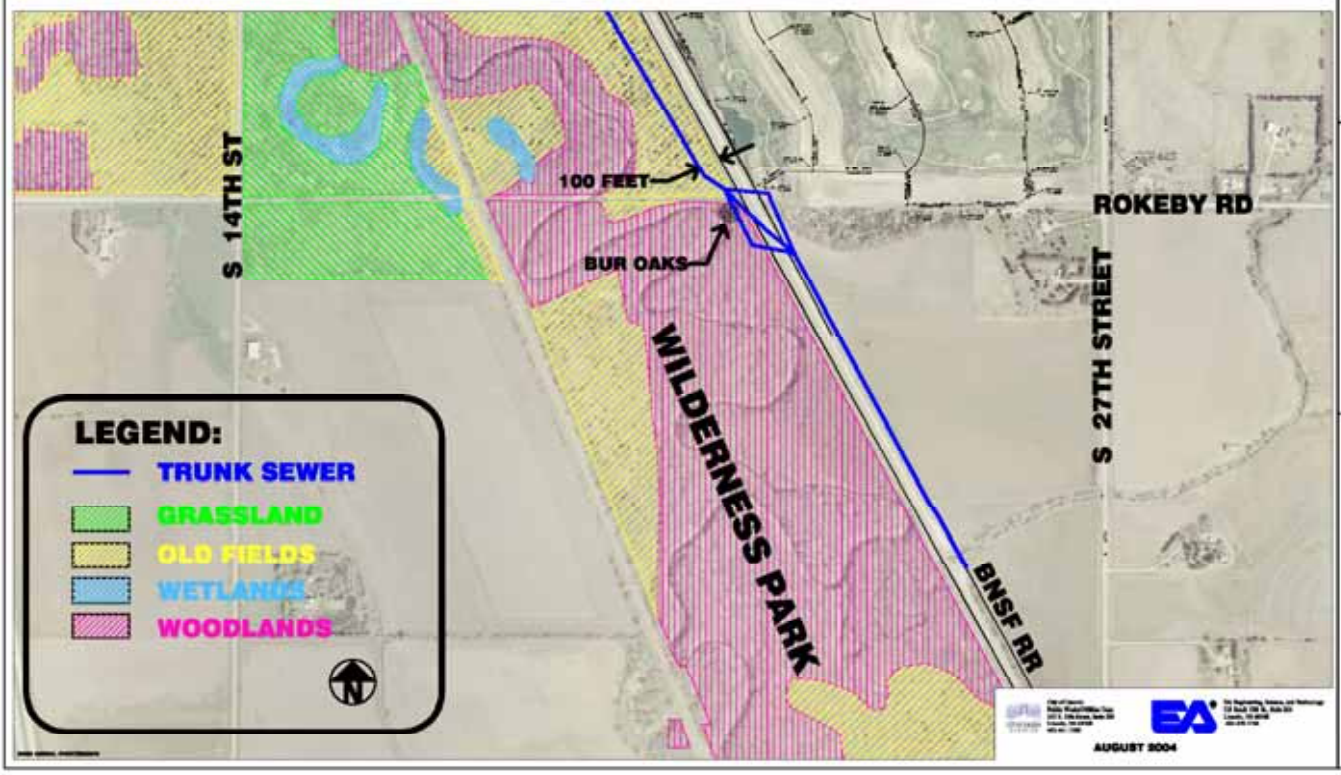
The second alignment option would begin at the same location in the park as the first option, but to bore under the BNSF tracks along a diagonal alignment to the southeast, in order to avoid the sandstone and additional depth on the golf course property. This will require a much longer bore under the railroad (potentially 300 feet or more). The BNSF Utility Accommodation policy requires crossings under the railroad to be perpendicular whenever possible, but will allow crossings at up to 45 deg. angles when conditions warrant. This alignment would require a crossing at 65 to 70 deg. from perpendicular, and may not be acceptable to BNSF Engineering.

The additional cost of increasing the bore length is significant, which makes this alignment option the most expensive for each service area alternative.

The third alignment option extends further south in Wilderness Park, south of Rokeby Road and into the woodland area of the park. This option would have the sewer route pass between the oxbow of Salt Creek and the BNSF property line. The alignment would extend approximately 250 to 300 feet south of Rokeby Road, and then bore under the BNSF tracks with an approximate perpendicular alignment. This option will be more invasive into the sensitive woodland area of the park, and may require significantly more restoration. However, the sandstone formation of the northern crossing location and the additional depth on the east side of the railroad would be avoided.

In order to determine the preferred option of these three alignments, it will be necessary to conduct further geotechnical investigations, to delineate the actual extent of the sandstone formation. Costs for each of the alternatives will be evaluated to compare economic considerations.

FIGURE 4 - ROKEBY ROAD ALTERNATIVES
UPPER SOUTHEAST SALT CREEK TRUNK SEWER
PRELIMINARY ROUTING STUDY
-LINCOLN WASTEWATER SYSTEM-



ROKEBY ROAD ALTERNATIVES

UPPER SE SALT CREEK TRUNK SEWER
PRELIMINARY ROUTING STUDY

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

DESIGNED BY	MAB
DRAWN BY	EC
CHECKED BY	LNG
DATE	8-24-04
SCALE	NONE
PROJECT NO.	13340.06
FILE NAME	-
DRAWING NO.	-
FIGURE	4
PROJECT NO.	05